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Cover

Gharial (*Gavialis gangeticus*)

A long-snouted crocodilian, endemic to the Indian subcontinent. In India, confined to Indus, Ganges, Bramaputra and the Mahanadi river systems. Largely eats fish. Endangered.

Photo : R.J. Ranjit Daniels

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"A certain modesty toward
understanding nature is a precondition
to the continued pursuit of science"

- Subrahmanyam Chandrasekhar
(Indian born - U.S. astrophysicist in an
interview, 1984)

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Cobra invites articles and short notes on reptiles and amphibians, their ecology, biology, natural history, conservation or other aspects. These may be of scientific or popular interest. Black and white photographs are also welcome.

Please send your contributions to the Editor, Cobra, Chennai Snake Park Trust, Rajbhavan Post, Chennai 600 022.

Further Additions to the Herpetofauna of Orissa, India

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Summary

Previous studies on the herpetofauna of Orissa, includes 17 species of amphibians, 3 species of crocodilians, 11 species of turtles, 21 species of lizards and 48 species of snakes (total : 100 species). The present paper includes an additional 29 species of amphibians and reptiles (3 amphibians, 5 turtles, 5 lizards and 16 snakes).

Introduction

The checklist of herpetofauna of Orissa, India reported by Dutta and Acharjyo (1990, 1993) includes 100 species. Additional studies by Dash and Kar (1990), Anonymous (1993), Pandav *et al.* (1994), Dutta (1991), Sarkar (1993) and Sanyal (1993) have yielded two more amphibians and 26 reptiles. Thus, the herpetofauna of Orissa comprises (to date) 129 species (20 amphibians, 3 crocodilians, 16 turtles, 26 lizards and 64 snakes).

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**Amphibians**

Excluding 17 species reported earlier, another unidentified *Philautus* sp. was reported by Dutta (1991). Sarkar (1993) included three additional species in his publication. However, his description of *Rana erythraea* from Orissa is based on specimens of *Rana taipehensis*, reported earlier.

Family : Ranidae**Genus : Limnonectes**

1. *Limnonectes keralensis* (Dubois, 1980) (Warty frog)

There is considerable confusion regarding the distribution and nomenclature of *Limnonectes keralensis*. In fact, the species is confined to southern India (Dutta, 1992) and is closely related to *Limnonectes limnocharis*. Probably, the specimens studied by Sarkar (1993) belong to *Limnonectes limnocharis* or some other species included in *L. limnocharis* complex.

2. *Rana malabarica* Tschudi, 1838 (Fungoid frog)

Family : Rhacophoridae**Genus : Philautus**

3. *Philautus* sp.

**Reptiles
Turtles**

Dutta and Acharjyo (1995) included 11 species of turtles in their list. A recent map produced by World Wide Fund for Nature - India (Anonymous, 1993) included 4 more freshwater turtles in the geographical range of Orissa. Further, Pandav *et al* (1994) and Dash and Kar (1990) reported another sea turtle seen along the Orissa coast.

**Family : Dermochelyidae (Marine turtles)****Genus : Dermochelys**

1. *Dermochelys coriacea* (Vandelli, 1761)
(Leatherback sea turtle)

Family : Bataguridae**Genus : Batagur**

2. *Batagur baska baska* (Gray, 1831)
(River terrapin)

Genus : Kachuga

3. *Kachuga tecta* (Gray, 1831)
(Indian roofed turtle)

Genus : Melanochelys

4. *Melanochelys trijuga trijuga* (Schweigger, 1812)
(Indian black turtle)

Family : Trionychidae**Genus : Aspideretes**

5. *Aspideretes hurum* (Gray, 1831)
(Indian peacock softshell turtle)

Lizards

Sanyal (1993) includes five more species to the previous list of twenty one species. However, he has followed old nomenclature for some of the lizards. The present nomenclature is based on Welch *et al* (1990).

**Family : Gekkonidae****Genus : *Geckoella***

1. *Geckoella jeyporensis* (Beddome, 1877)
(Orissa rock gecko)
2. *Geckoella nebulosa* (Beddome, 1870)
(Andhra rock gecko)

Family : Lacertidae**Genus : *Ophisops***

3. *Ophisops beddomei* (Jerdon, 1870)
(Beddome's Snake-eyed Lacerta)
4. *Ophisops jerdonii* (Blyth, 1853)
(Punjab Snake-eyed Lacerta)

Family : Scincidae**Genus : *Mabuya***

5. *Mabuya dissimilis* (Hallowell, 1857)
(Striped Grass Skink)

Dash and Kar's (1990) report on occurrence of *Chameleon vulgaris* is a wrong nomenclature of the species. In fact, the only species *Chamaeleon zeylanicus* is seen in India and other neighbouring countries and Bhitarkanika report (Dash and Kar, 1990) of *Chamaeleon* belongs to *Chamaeleon zeylanicus*.

**Snakes**

Previous reports by us (Dutta and Acharjyo, 1990; 1993) contain 48 species including two estuarine sea snakes. However, 20 species of sea snakes are known to occur in the Indian coast, of which 12 species (excluding 2 previous reports) have further been reported to occur in the sea coast of Orissa (Dutta : personal observation ; Sanyal, 1993). Thus, 14 species of sea snakes occur in the sea coasts of the State. Sanyal, (1993) also included 5 more species of snakes in his list. However, the File snake (*Acrochordus granulatus*) included in Sanyal's (1993) list, has already been reported in Dutta and Acharjyo's (1993) paper as *Chersydrus granulatus*. Thus an additional 16 species of snakes are added to the previous reports by us. Most of the sea snakes are trapped in fishermen's nets in the fishing belts of Chandbali in Bhadrak District, Chandipur in Balasore District, Paradeep coast in Cuttack District, Puri-Konark sea coast and Chilika Lagoon in Puri District. Of all the sea snakes, *Lapemis curtus* is a common species in Paradeep coast. Another estuarine sea snake, *Hydrophis obscurus* is quite common in Chilika Lagoon.

The present paper follows Welch's (1988) nomenclature of snakes.

Family : Hydrophiidae (Sea Snakes)**Genus : *Hydrophis***

1. *Hydrophis caeruleus* (Shaw, 1802)
(Malacca sea snake)
2. *Hydrophis fasciatus fasciatus* (Schneider, 1799)
(Banded sea snake)
3. *Hydrophis stricticollis* Gunther, 1864
(Bengal sea snake)

Genus : Kerilia

4. *Kerilia jerdonii jerdonii* Gray, 1849
(Jerdon's sea snake)

Genus : Lapemis

5. *Lapemis curtus* (Shaw, 1802)
6. *Lapemis hardwickii* Gray, 1835

Genus : Leiocephalus

7. *Leiocephalus spiralis* (Shaw, 1802)
(Yellow sea snake)

Genus : Leioselasma

8. *Leioselasma cyanocinta* (Daudin, 1803)
(Annulated sea snake)

Genus : Microcephalophis

9. *Microcephalophis cantoris* Gunther, 1864
(Narrow-headed sea snake)
10. *Microcephalophis gracilis* (Shaw, 1802)
(Common narrow-headed sea snake)

Genus : Pelamis

11. *Pelamis platurus* (Linnaeus, 1766)
(Yellow and black sea snake)

Genus : Praescutata

12. *Praescutata viperina* (Schimdt, 1852)
(Viperine sea snake)

Family : Typhlopidae

Genus : Typhlops

13. *Typhlops diardii diardii* Schlegel, 1839
(Large worm snake)

Family : Colubridae

Genus : Dendrelaphis

14. *Dendrelaphis pictus pictus* (Gmelin, 1789)
(Painted bronze-back)

(This species is mentioned as *D. ahaetulla* in Sanyal's (1993) list and *Denderelaphis shaetula* in Dash and Kar's, 1990 list.)

Genus : Gerardia

15. *Gerardia prevostiana* (Eydux and Gervais, 1837)
(Glossy marsh snake)

Genus : Psammodynastes

16. *Psammodynastes pulverulentus* (Boie, 1827)
(Mock viper)

Dash and Kar (1990) reports the occurrence of *Bungarus candidus* in Bhitarkanika Wildlife Sanctuary. However, the species is never found in Orissa and perhaps *B. candidus* reported by Dash and Kar (1990) might belong to *B. caeruleus*. Further, their paper also reports *Pytas nueous* which is perhaps a typographical error for *P. mucosus*.

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Nesting Biology of Gharial (*Gavialis gangeticus*) in National Chambal Sanctuary

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Introduction

Geographically, the National Chambal Sanctuary lies between the Lat. 25° 30' N and 76° 28' E and 79° 01' E and covers about 425 km long stretch of the Chambal river from Pali to Bhare. This part of the Chambal river was declared as a gharial sanctuary during 1978-79 by Madhya Pradesh Government with an aim to provide fully protected habitat for endangered crocodilian species and other aquatic animals. The present study reports on the new nesting sites, and number of nests during 1995 nesting seasons.

Materials and Methods

Nesting of gharial is a seasonal phenomenon. In Chambal, gharials lay eggs during late March and early April (Rao, 1988). To collect information on the gharial nesting, all these nesting sites were surveyed during March-April 1995. Nests were located with the assistance of the field staff by probing with iron rod, (Singh, 1978) where signs of actual nesting are seen. After locating the nests, they were excavated carefully, data were noted on the situation of the nests, distance from water, height above water level and nest temperature at the site.

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Results and Discussion

A total of 18 nesting sites were identified in the Chambal river, where a total of 75 nests were located. 42 nests were located in the South National Chambal Sanctuary (Pali to Rajghat) (200 km) with a density of 0.21 per km. Rest of the 33 nests were located in the North National Chambal Sanctuary (Rajghat - Bhare) (225 km). The density was 0.14 per km. Gharials are communal hole nesters, preferring to lay eggs on coarse sand bank (Rao and Singh, 1987). Nesting was not found in areas where there was no sand. Where sand bars and peninsulas are present, gharials bask on these peninsulas near nesting sites and keep watch on the nests against nest predation.

Authors' observation substantiate the finding of Whitaker and Basu (1983), Choudhury *et al* (1983), Rao (1988) and Jai Prakash Narayan *et al* (1994). These studies described the nesting season of gharial to be late March to early April.

During 1995 the first gharial nest was located on 20th March at Baroli and the last on 9th April at Gyanpura. The mean ambient temperature during the nesting season was 29°C. The hatching commenced on 1st June and ended on 12th June. Hatching in the wild was ascertained by counting the number of empty shells after the mother had opened a nest. (Singh and Rao, 1986). During the first week of June when the hatching time was approaching, haul out tracks to the nests were numerous.

The gharial selects places that are 1m to 3m above water level and have a mean distance of 10.5 m from water. This protects their nests from any possibility of floods in the river. They dig nest holes and lay eggs. The depth of nests varies between 40-45 cm from the surface. Three new nesting sites were located at Sevarpali, Kathumari and Dinpura where seven nests were found.

The mean diameter of the nest at the mouth is 45 cm and at the bottom is 56 cm. Mean clutch size of gharial in Chambal during 1995 was 36.7. The studies on the nesting activities of gharial in the Chambal



Table 1 : Distribution of Gharial nests in the National Chambal Sanctuary 1995.

Nesting Site	Number of Nests	Number of Eggs	Number of hatchlings	Spoiled Eggs
Bagdia Sand	4	138	128	10
Goborda	4	132	124	8
Devgur	5	169	154	15
Baroli	6	248	220	28
Nadigaon	15	615	574	41
Banbora	1	28	22	6
Bharra	5	159	148	11
Sevar pali	2	42	38	4
Tigri rithora	8	388	358	30
Kathmari	4	136	118	18
Pureni	5	198	181	17
Daljit Kapura	1	30	26	4
Barsala	2	54	50	4
Barenda	5	140	122	18
Dinpura	1	38	32	6
Magera	3	72	66	6
Khera	2	80	70	10
Gyanpura	2	92	73	19
	75	2759	2504	255



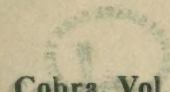
Sanctuary indicated increasing trend in the number of gharial nests. During 1995 a total of 75 gharial had nested showing an increase of 63 nests over 1978, when their number was only 12.

Acknowledgements

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Occurrence of Saw scaled viper, *Echis carinatus* (Schneider) (Viperidae : Serpentes : Squamata : Reptilia) in Trichur district, Kerala

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The Saw scaled viper, *Echis carinatus* (Schneider) is known to occur in India, across South-Western Asia extending to Africa north of the equator and in Sri Lanka (Smith, 1943). The species inhabits semi-desert and broken scrubland areas in its range. Gunther (1864) states, "This little venomous snake is common in many parts of the peninsula of India in the Anamallay Mountains, in the Carnatic and in the vicinity of Madras." Wall (1908) gives the distribution of the species as throughout a large area of the Indian Peninsula. According to Smith (1943), the species is distributed in the whole of India south of the Ganges, except Bengal and its preference for dry country accounts for its absence on the coast of the Peninsula west of the Western Ghats, south of Karwar. However, the occurrence of the species south of Karwar was established by Adiyodi (1961) based on a collection procured from Devagiri (Calicut), Kerala. Daniel (1983) mentioned that the saw scaled viper is not recorded in the Cochin and Travancore areas of Kerala. Recently, the occurrence of the species in Chinnar Wildlife Sanctuary, Kerala was reported by Basu Jahas *et al* (1996).

The present report is based on yet another collection of the species from the Trichur district of Kerala.

Materials Examined

Echis carinatus (Schneider)

Pseudoboa carinata Schneider. 1801, *Hist. Amphib.* ii.p.285.

Echis carinata (Schneider), Merrem. 1820, *Tent. Syst. Amphib.* p. 149.

One sample collected by Z.S.I survey party (Regd. No. 8026).

Locality : Scrub jungle habitat at Asurankundu, Vadakkancherry forest range, Trichur forest division, Trichur district, Kerala.

Date : 8-x-1995.

Collector : K.C. Gopi & Party.

Measurement : Snout to vent length, 24.5cm.; tail length, 2.5 cm.

(Total length, 27 cm.).

With the current finding in Kerala, the saw scaled viper is so far recorded from rocky and scrub jungle habitats of Devagiri (Calicut district), Chinnar Wildlife Sanctuary (Idukki district) and Asurankundu (Trichur district). These records suggest that the species is enjoying a wide distribution in Kerala. The species is locally known as 'Churuttamandali'.

Acknowledgement

The author is grateful to the Director, Zoological Survey of India, Calcutta for facilities and encouragement.

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A Note on the food habit of the House Gecko

Hemidactylus flaviviridis

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On 2nd June, 1996, I happened to observe a very interesting unusual feeding behaviour of a house gecko *Hemidactylus flaviviridis*, at my residence. A large size gecko was moving around a dustbin in the morning. The gecko picked up a red coloured flower of hibiscus from the dustbin and tried to gulp it down. After eight minutes the gecko swallowed the whole flower. I thought it was unusual behaviour but the same type of behaviour was observed by me previously on 8th August 1989. After a week the same gecko was observed around my dining table and it licked an empty tea pot. I had kept a small piece of sweet on the table for fun. At night the same gecko came and licked the sweet and within a week, the gecko had finished it off. It became a routine for that gecko to come to the table and lick pieces of sweet or tea pots.

According to Smith (1938), house geckos eat rice grain and they also appreciate sugar. There are also a few reports of vegetable food being found in the stomach of insectivorous lizards (Table 1). The present observation lends support to the fact that the gecko takes vegetable matter as an occasional food item.



Table 1 : List of recorded lizard species, which use plant material as occasional food items.

No.	Species of Lizards	Vegetation items (Source).
Gekkonidae		
1.	<i>H. brooki</i>	* Rice grain (Smith, 1938).
2.	<i>Hemidactylus sp.</i>	* Seeds of wild plants (Sharma, 1982).
Agamidae		
3.	<i>Sitana ponticeriana</i>	* Fiber of wild plants (Sharma, 1982).
4.	<i>Calotes versicolor</i>	* Seed of grass <i>Coix lachryma-jobi</i> and fruit of <i>Lantana</i> (McCann, 1940). * Seed of <i>Lima</i> bean (Daniel and Shull, 1963). * Vegetable matter, grass, leaves, twigs and seed (Sharma, 1982). * 16 species of plants leaves and flowers (Bhatti <i>et al.</i> , 1987) * Buds of <i>Tabernae montana</i> (Sekar, 1988).
Scincidae		
5.	<i>Mabuya carinata</i>	* Fibers of wild plants (Sharma, 1982).
Varanidae		
6.	<i>Varanus bengalensis</i>	* Fibrous vegetable matter (Sharma, 1982).



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An Oversize Rock Gecko (*Hemidactylus maculatus*) from Igatpuri, Maharashtra.

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Rakhi Aparment, Rambaug colony,
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While staying in a sanitarium at Igatpuri (Nashik district, Maharashtra) at the end of a hot season of 1993, I frequently came across a huge rock gecko (*Hemidactylus maculatus* Dum. and Bibr) This gecko had made its home below a projecting gallery of a prayer-hall. I first saw the gecko on the 1st June. Till I left the place on the 8th of June the lizard used to be seen around the same spot everyday. I could not catch it, for chasing and catching any live creatures was forbidden in the sanitarium. On one of the occasions the gecko was resting on the outer wall. It was drizzling and the wall was apparently wet. Seeing me approaching, the gecko hurriedly disappeared in one of the adjoining cracks, leaving behind a shadow-like dry imprint on the apparently wet wall. I had neither a piece of string nor a measuring scale with me at that moment. There was fear of the shadow-like imprint disappearing fastly and merging with the rest of the wet surrounding for raindrops had started sprinkling on the dry patch. I immediately plucked a length of grass and measured the imprint from tip to tip.



I measured the grass and found it to be about 280 mm. Daniel (1983) states that these lizards can grow up to 270 mm. Considering the sinuosity of the shadow-like imprint of the lizard I feel that the total length of the lizard must have been more than what I actually measured. During the next three years (1993-96), I caught and measured seven supposed-to-be full grown specimens of rock gecko - 6 from around Pune and 1 from Varsai - a village from Pen taluka of Raigarh district (Central Konkan). Though seven is too small a number to be treated as sample it can throw some light on the length of the species from this part of the state. In this case the average length was found to be around 160 mm (minimum being 140 mm. and maximum 215 mm.) Considering this as the normal length for the species as a whole for the region, Igatpuri specimen seems to be oversize.

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Courtship of *Bufo melanostictus* Schneider.

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Dum Dum, Calcutta - 700 074.

Very little attention has been paid on the courtship of Indian anurans, except few stray publications by Mallick (1986, 1988) on male-female interaction prior to amplexus in *Rana limnocharis* and *Rana cyanophlyctis*.

The present study was carried out in the vicinity of Duillya, Howrah, West Bengal, India, during monsoons (May to August), from dusk till midnight, over a period of five consecutive years (1992 - 1996).

Courtship usually takes place near (and rarely far away from) permanent water bodies. Breeding peaks during full moon nights, which is similar to the observation by Church (1960), where he noted "During the time of full moon more females were collected that were ready to ovulate or had just ovulated than there was on no moon".

Female *Bufo melanostictus* selects males from about a distance of three meters by hearing advertisement call of a particular male. The female slowly hops towards that calling male. As soon as the male stops calling, the approaching female stops. When this particular male again resumes his calling, the female turns one of her eye and tympanum towards the calling male for final identification of her mate. Soon after this identification the female again starts hopping towards the calling male. When the approaching feamale reaches within 15 cm of the male, the male stops calling and simultaneously the female becomes stationary.

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After a short pause, the male resumes calling and the female on final confirmation of selected male by audiovisual method, reaches either in snout to snout position (observed in eight cases) or by the side (right to left) of the male (observed in seven cases). The male during the phase of calling identifies the female as his mate by monocular vision and quickly concluding his calling, starts either clockwise or counter-clockwise movement (observed in 7 cases) or quickly turns right angle to the female (observed in 8 cases) and jumps over the back of the female and lock into axillary amplexus.

To study such courtship the amplexed couple (observed in 5 cases) are separated and the separated individuals soon after forcible separation fled with short jumps at a distance of 6m. Within a minute, the male under watch starts calling and the specific female which was marked by fixing of a small piece of cellotape on the dorsal surface beneath the eyes and in between the parotid glands, becomes alert and directs one of her tympanum towards the calling male selected previously. Then the female hops again towards the same male and ultimately lock into axillary amplexus following the same steps of courtship stated above. Time taken from forcible separation of amplexed couples to meeting again into amplexus was five to seven minutes.

From the above observations it may be concluded that particular female and male select each other as their mates by audiovisual and visual methods respectively in the same breeding area during the same breeding period.

Acknowledgement

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Random Harvest

How to revive a 'dead' snake

I have just read an interesting book, *I Dreamed of Africa* (1991) by Kuki Gallmann. The author, an Italian, got interested in Africa from her early years and, in 1972, took up residence, along with her husband, in Kenya where she brought up her son and daughter. The son, Emanuele, developed a fascination for snakes even as a child and became quite an expert in handling them and kept a large number of them. He died aged seventeen, bitten by a puff adder.

There is a curious account in the book of how he once revived an apparently dead female spitting cobra by 'mouth - to - mouth resuscitation'. The cobra had escaped from his collection and was hiding in a hole. He tried to smoke her out and, in the process, the snake got suffocated. Emanuele told his mother : " Her heart has stopped, she's quite dead". He then remembered how, a few days earlier, he had seen a friend reviving a young calf by blowing down his lungs through a pipe. Emanuele went inside the house, picked up a silver straw from the bar and carried out a similar exercise on the snake. "When he came back a little later I could see he had succeeded. His face was alight, transformed as only his face could be. He explained to me how the heart had started beating again, and the elation he had felt at being able to resuscitate her ."



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(WWF INDIA Network Newsletter April 1997)

- B Vijayaraghavan

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